Understanding Investment – the Effects of Language

Research Thesis

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Abstract

Investment, as a major part of business activities, has always been a popular topic of business research. Having a business and psychology background, I am interested in exploring people's investment behaviors from a behavioral-finance standpoint. Previous research has shown that language differs in whether it requires its speakers to mark future events using grammatical markers, and this difference actually affects people's saving behaviors. Given that savings and investment are highly correlated with each other, the purpose of my research is to see whether there is a similar relationship between language and investment behaviors. I gathered information of 23 kinds of language representing 37 countries. The main method used in my study is regression analysis. Current progress shows that though other major variables that were shown to affect people's investment rates have been controlled in the regression, language does not seem to have a statistically significant impact on investment. This result is not consistent with the finding of the previous research that language affects savings. Therefore, my study provides evidence to question the findings of the previous research.

Acknowledgments

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Fields of Study

Major Field: Finance

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Chapter 1: Introduction

After the 2008 financial crisis, the global economy is gradually recovering from the distress. At the same time, the confidence of people towards economy is recovering as well. More people start to go back to their investment activities. However, people did not forget to examine the reasons why 2008 economic tragedy happened. They introspected what the global economy went through during the financial crisis, and noticed that some countries, with similar economic capabilities and financial institutions, had totally different economic performances. This difference was shown across assorted aspects of the countries' economy, including saving and spending activities. Investment, as one of the largest parts which people spend their money on, drew my interest.

What factors influence the investment actions of people? More specifically, for my own personal interest, what behavioral factors affect the investment actions of people? These questions have actually been studied over thousands of times. Economic and financial scientists have identified a lot of factors that have been publicly recognized as investment influencers, such as personal risk aversion (Bodie, Kane & Marcus. Page 122-23), but there are also some recently found factors that give people complete new perspectives to think about investment behaviors. For instance, two Indiana University finance professors Veronika Pooland, Noah Stoffman, and one Cornell University professor Scott Yonker did a study on investment portfolio managers and surprisingly found out that "The portfolio overlap of funds whose managers reside in the same neighborhood is considerably higher than that of funds whose managers live in the same city but in different neighborhoods. These effects are larger when managers are neighbors longer or are of a similar ethnic background, and are not explained by preferences" (Pool, Stoffman & Yonker. Abstract) The overlap between the portfolios of fund managers whose are neighbors is

38% greater than that between the portfolios of managers who are not neighbors (Pool, Stoffman & Yonker. Page 34-35). This is a perfect example demonstrating how behavioral factors could influence the investment behaviors of people. Having a psychology background, I am very interested in identifying more such kinds of factors to help the public understand the mechanism of investment.

In this paper, I designate my research to explore language people speak, which has been proved to be a factor affecting people's saving actions and can be a potential influencer of investment actions as well. People speak different language around the world, and sometimes even within one country. My research is aimed to find out whether the investment rates and investment behaviors of people vary across countries when the language the people speak differs in whether or not the languages require speakers to mark future events using grammatical markers. After several months of collecting and analyzing data, it has been shown that there is no statistically significant relationship between people's investment behaviors and the language they speak.

Moving forward, this paper will address the following: related literature (Chapter 2), research model (Chapter 3), results (Chapter 4), and discussion of results and potential future work (Chapter 5). In addition, Appendix and a reference list will follow each chapter of the thesis.

Chapter 2: Related Literature

A. ***The Effect of Language on Economic Behavior: Evidence from Savings Rates, Health Behaviors, and Retirement Assets*** **– Inspiration of my research idea**

The research, *The Effect of Language on Economic Behavior: Evidence from Savings*

Rates, Health Behaviors, and Retirement Assets, was conducted by Keith Chen, a professor at the University of California, Los Angeles. The research explores the relationship between saving rates and language people speak. It proposes and then supports a hypothesis that if a kind of language grammatically separates the future and the present, it would lead its speakers to take less future-oriented actions, that is, saving in this research (Chen. Page 1).

a. Language categorization

The research indicates that "language differ[s] widely in both how and when it requires speakers to signal that they [are] talking about the future" (Chen. Page 3), and it adopts "a future-time criterion from typological linguistics" to categorize languages into two broad categories: futured language and futureless language (Chen. Page 1).

If language is a futured language, it means every time people use this language to discuss any future events, they need to cleave the events from the presents grammatically (i.e. using some grammatical markers in their sentences, such as "will"). English is a kind of futured language.

Examples for futured language: English

1. It will [*future marker*] rain tomorrow. [Correct]

   It rain tomorrow. [False]

2. I am going to [*future marker*] a meeting tomorrow. [Correct]

   I go to a meeting tomorrow. [False]

As for futureless language, it does not require speakers to grammatically differentiate future events and present events. This kind of language equals the future to the present. A good example for the futureless language is Chinese Mandarin. There is no grammatical future marker such as "will" or "be going to" involving in the structure of the sentences in Mandarin.

Examples for futureless language: Chinese Mandarin

1. 明天下雨。

It rains tomorrow. [Correct]

2. 我 明 天 去 开 会。

I go to a meeting tomorrow. [Correct]

b. Underlying mechanism of the effects of language on future actions

The underlying mechanism in this research is called "Obligatory distinctions bias beliefs" (Chen. Page 5-6). This mechanism claims "language may affect future choices by changing how distant future events feel" (Chen, Page 5). Futured language speakers are forced to distinguish between future events and present events grammatically, so the future events seem more in distance to them, and thus they have less feelings that their future is correlated with their present actions. As a result, they take fewer future-oriented actions. In contrast, futureless language speakers are not required to have such a distinction in their language grammars, so they perceive future events as close as present events, and thus have stronger feelings that their present actions will have large impacts on their future. As a result, they take relatively more future-oriented events (Chen. Page 5-6). Based on this mechanism, Professor Chen made the hypothesis that saving rates, which is the one of the indicators of future-oriented actions, would be higher among futureless language speakers than among futured language speakers (Chen. Page 5-6).

c. Results of the research

After collecting data from European Science Foundation's Typology of Languages in Europe (EUROTYP), online-text researches, SHARE surveys, and World-Values Survey (WVS), the research does hypothesis tests as well as regression analysis on the data. The results of the tests and analysis support the original hypothesis that futured language induces less future-

oriented actions among its speakers while futureless language leads to more future-oriented actions. In other words, if a language grammatically separates the future and the present, it will lead its speakers to save less (Chen. Abstract). Statistically, futureless language speakers are "31% more likely to have saved in any given year" (Chen. Page 2). More specifically, they tend to accumulate 39% more wealth by retirement, which is one of the main purposes of people' saving actions (Chen. Page 2). Language even has an effect on people's perception of saving, as futureless language speakers value savings more than futured language speakers.

d. Inspiration of my research idea

After reading through the research of Professor Chen, I was inspired by his idea on identifying relationships between language and future-oriented actions. Considering that investment is also a type of future-oriented actions, just like savings, I decided to choose investment as my research topic and try to see whether the conclusions from Professor Chen's research could be applied to broader areas.

B. *Investor Protection, Equity Returns, and Financial Globalization* – adoption of investment-related data

The research, *Investor Protection, Equity Returns, and Financial Globalization,* was conducted by Mariassunta Giannetti and Yrj ¨o Koskinen, who are faculty at University of Washington, Seattle. It studies "the effects of investor protection on stock returns and portfolio allocation decisions" (Giannetti, Koskinen. Page 135). This is the primary source of the data included in my research analysis.

a. Data collection difficulty

In my research, after comparing the advantages and disadvantages of primary data and secondary data, I decided to collect existing data because of its time and budget saving features.

In order to analyze the effects of language on people's investment behaviors, I needed to identify countries that speak either future languages or futureless languages and gather investment rates of those countries at individual-investor levels. However, the data collection of my research was actually much harder and more complicated than expected. At the beginning, I thought individual-level data could be gathered very easily, but after searching through different data sources, I realized that investment-related data was much less than saving-related data, and most existing investment data was at country levels, rather than individual levels. Even in some national household surveys of several countries, there was only information of general investment tendencies within the countries, and it was impossible to generate specific rates of investment based on such information.

One day, I came across the research of Mariassunta Giannetti and Yrj ¨o Koskinen. In the research, they also encountered the same data collection problem I was facing. As mentioned in their paper, the first attempt of comparing international households' portfolio choices happened in 2001, involving France, Germany, Italy, Sweden, the U.K., and the U.S. (Giannetti, Koskinen. Page 151). The household surveys of these countries indicated "that there [were] sizable differences in stock market participation rates across countries" (Giannetti, Koskinen. Page 151). Interested in this indication, Giannetti and Koskinen wanted to see how specifically investors protection would influence the stock market participation rates. After a lot of effort, they finally managed to gather household investment rates of different countries at a household level. The data was later adopted in my research.

b. Consolidated final data

Giannetti and Koskinen gathered data from various sources regarding domestic investors' participant rates in domestic stock markets and foreign equity holding rates by domestic

investors. Their main data sources included surveys conducted by World Federation of Exchanges, National Household surveys and individual professional research (Giannetti, Koskinen. Page 152). The two rates indicate the fraction of households who directly held domestic stocks or foreign equity (Giannetti, Koskinen. Page 152).

Giannetti and Koskinen also controlled several country characteristics that would affect the investment rates. The characteristics included Antidirector Rights, Private Enforcement, Gini Coefficient of Income, Stock Market Capitalization/GDP and Adult Population's Average Years of Schooling (Giannetti, Koskinen. Page 151-153). The Antidirector Rights is "an index of shareholder protection". The Private Enforcement is "an index obtained by averaging indicators of disclosure requirements and liability standards that make it easier for investors to recover damages when information is wrong or omitted" (Giannetti, Koskinen. Page 152). And Adult Population's Average Years of Schooling indicate the average years of schooling of the total population over 25 years old.

The final consolidated data set includes 39 countries with their corresponding country features. Refer to Appendix A for consolidated data (Giannetti, Koskinen. Page 152).

c. Adoption of the data

In my research, I adopted the consolidated investors' participation rates and foreign equity holding rates as my dependent variables. For my independent variables, I included Antidirector Rights, Gini Coefficient of Income, Market Capitalization/GDP, and Log GDP per capita. These variables had been proved to influence people's investment tendencies in Giannetti and Koskinen's research.

Chapter 3: The Model

As discussed above, my original data set included 39 countries. However, some of the countries did not have information for both the domestic rates and the foreign holding rates. 25 countries (Appendix B) were related to the domestic investment household participation rates and 35 countries (Appendix C) were associated with the foreign equity holding rates.

I then categorized the countries into a futured language set and a futureless language set based on the language criteria described in Chapter 2. In total, the 39 countries presents 27 kinds of language, but because of the limited amount of the information that could be used to identify the language, there were finally only 23 kinds (Appendix D) included in my analysis.

Next, a regression was run on the domestic investment group and the foreign equity group. In order to show the effect of language, besides including Antidirector Rights, Gini Coefficient of Income, Market Capitalization/GDP, and Log GDP per capita as controlled variables, I introduced language as a dummy variable into the regression (the futured language as "1" and the futureless language as "0"). Continue to Chapter 4 to review regression results.

Chapter 4: Main Results

Based on the results of my regression, as 95% confidence interval is used in the analysis, there is no statistically significant relationship between language people speak and their investment behaviors.

For the Foreign Equity Holding group, as shown in the Table 1 and 2 below, the model is overall statistically significant since the p-value is very small (i.e. less than 0.05), but the Language's p-value is larger than the 0.05 threshold in models, which means language is not significant as an influencer of the foreign equity holding rates.

Multiple Regression for Foreign Equity Holding				
	Multiple R	R-Square	F	p-Value
Summary	64.67%	41.83%	4.17	0.01

Table 5. Regression results of the overall model for Foreign Equity Holding Rates

	Coefficient	t-Value	p-Value
Language	0.049	0.41	0.69

Table 6. Regression results of Language for Foreign Equity Holding Rates

For the Domestic Participation group, the regression results are shown in Table 3 and 4 below. The results here are the same as the results of the Foreign Equity Holding group: the model works but the Language itself does not.

Multiple Regression for Domestic Participation Rate				
	Multiple R	R-Square	F	p-Value
Summary	75.48%	56.98%	5.03	0.00

Table 7. Regression results of the overall model for Domestic Participation Rates

	Coefficient	t-Value	p-Value
Language	0.072	1.13	0.27

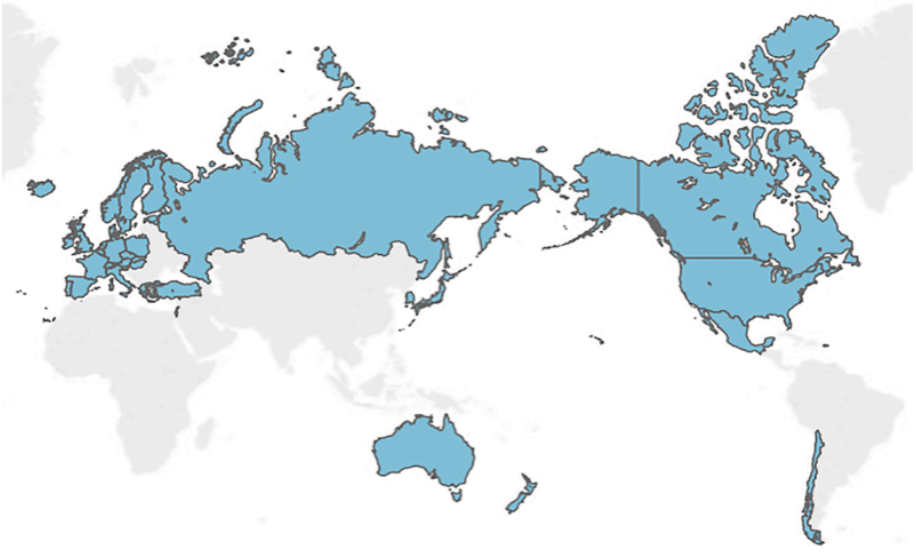
Table 8. Regression results of Language for Domestic Participation Rates

In conclusion, no matter if it is for domestic or foreign investment rates, language does not demonstrate statistically significant influence on people's investment behaviors. The complete regression analysis results for the models are included in Appendix E.

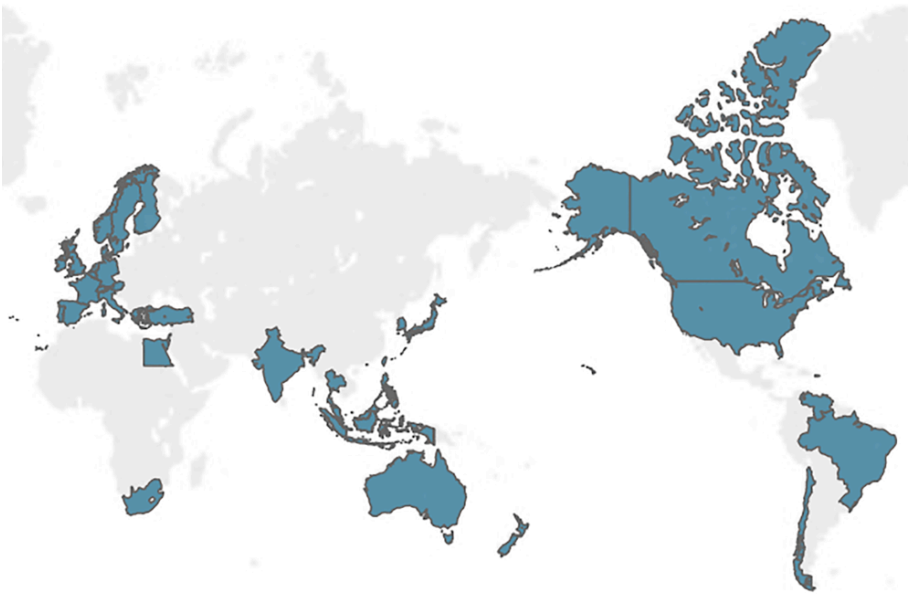
Chapter 5: Discussions and Future Work

The findings of my research provide the ground to question the conclusion of the previous research on savings and language. Since savings and investment are highly correlated with each other, it is reasonable to predict that if one thing affects savings, it would affect investment in some way or another. However, this prediction does not hold in this case. While language has been proved to affect saving rates, it does not seem to affect investment. There is an inconsistency between the findings of Keith Chen's research and mine.

The inconsistency between the research findings leads to questions on the generalization of Keith Chen's conclusions. First, do his conclusions of language still hold firmly for other future-oriented actions besides savings? Second, do his conclusions apply to all parts of the world or just the countries that were included in his research? Originally, I assumed that the finds of the previous research could be perfectly generalized, so I did not control which countries were included in my research. As shown by Graph 1 and 2 below, the shaded areas on the maps indicate the countries that are analyzed in the two research:



Graph 1. Countries included in Keith Chen's research



Graph 2. Countries included in my research

As shown by the maps, although there are some overlaps, a noticeable amount of countries are different in the two research, especially for Asia and Europe. This difference actually creates difficulties on interpreting the final results. It is hard to tell at this stage that which of the changes, the changes of the countries or the changes from savings to investment, contributes more to the inconsistency between the conclusions. To solve this problem, for next steps, only one change will be kept in my research: either Keith Chen's countries will be analyzed for their investment rates or my countries will analyzed for their saving rates. Hopefully, the effects of the individual changes could be clear.

The inconsistency of the finds also leads to considerations on the quality of my data set. In the date set, the futured language has significantly more representatives than the futureless language (the ratio is around 8 to 1). This could be one problem that needs to be paid attention to in the future steps of the research. However, the problem is not very likely to be perfectly solved because it is just the fact that there are much more futured language than futureless language in

the world, so when samples are collected, it is very hard to keep a balance between the amount of the futured language representatives and the amount of the futureless language representatives. How well the samples could represent the whole population is still open to discussion.

Appendix A: Consolidated data from the previous research

Country	Domestic Investors' Participation Rates in the Domestic Stock Market	Foreign Equity Holdings by Domestic Investors	Antidirector Rights	Private Enforcement	Stock Market Capitalization in Billion $	% of Closely Held Market Capitalization
Argentina		0.507	4	0.36	16.549	60.16
Australia	0.404	0.243	4	0.71	380.087	42.06
Austria	0.056	0.708	2	0.18	33.578	62.99
Belgium	0.050	0.666	0	0.43	115.224	53.91
Brazil		0.054	3	0.29	126.762	67.28
Canada	0.250	0.302	5	0.96	570.223	27.75
Chile		0.214	3	0.46	49.828	66.64
Denmark	0.280	0.457	2	0.68	76.750	46.95
Egypt		0.034	2	0.36	26.330	51.67
Finland	0.187	0.220	3	0.58	138.833	41.49
France	0.150	0.387	3	0.49	825.070	62.37
Germany	0.089	0.572	1	0.21	686.014	63.86
Greece	0.102	0.057	2	0.39	66.040	60.43
Hong Kong	0.138	0.319	5	0.79	463.055	55.84
India	0.033		5	0.79	242.844	53.57
Indonesia		0.005	2	0.58	55.739	66.79
Ireland	0.170	0.791	4	0.61	59.938	33.78
Israel		0.101	3	0.67	40.774	61.89
Italy	0.070	0.507	1	0.44	477.075	49.57
Japan	0.297	0.155	4	0.71	2,095.516	45.18
Korea		0.020	2	0.71	246.911	35.60
Malaysia		0.026	3	0.79	122.892	47.83
Netherlands	0.140	0.495	2	0.75	395.560	43.92
New Zealand	0.310	0.458	4	0.55	21.715	49.45
Norway	0.210	0.599	4	0.51	68.103	45.61
Philippines		0.024	4	0.92	18.183	73.44
Portugal	0.145	0.358	3	0.54	41.931	63.81
Singapore	0.083	0.418	4	0.83	101.554	57.70
South Africa		0.379	4	0.75	116.544	51.97
Spain		0.162	2	0.58	461.560	50.24
Sri Lanka	0.023		3	0.60	1.680	48.00
Sweden	0.220	0.452	3	0.46	179.117	37.44
Switzerland	0.176	0.428	2	0.55	547.020	46.62
Taiwan	0.125		3	0.79	261.311	27.11
Thailand		0.004	3	0.71	45.406	58.34
Turkey	0.012	0.003	2	0.36	34.217	62.38
UK	0.300	0.311	5	0.75	1,800.658	33.93
US	0.260	0.163	5	1.00	11,055.578	39.53
Venezuela		0.004	1	0.19	3.980	37.94

Appendix B: Countries in Domestic Participation Rate Group

Australia

Austria

Belgium

Canada

Denmark

Finland

France

Germany

Greece

India

Ireland

Italy

Japan

Netherlands

New Zealand

Norway

Portugal

Singapore

Sweden

Switzerland

Turkey

UK

US

Hong Kong

Taiwan

Appendix C: Countries in Foreign Equity Holding Rate Group

Argentina
Australia
Austria
Belgium
Brazil
Canada
Chile
Denmark
Finland
France
Germany
Greece
Indonesia
Ireland
Italy
Japan
Korea
Netherlands
New Zealand
Norway
Philippines
Portugal
Singapore
Spain
Sweden
Switzerland
Thailand
Turkey
UK
US
Venezuela
Egypt
Hong Kong
Israel
Malaysia

Appendix D: Language included in the research

English

Mandarin

Cantonese

Danish

Dutch

Finnish

French

Germany

Greek

Hindi

Indonesia

Italian

Japanese

Korean

Malaysian

Norwegian

Portuguese

Russian

Spanish

Swedish

Thai

Turkish

Arabic

Appendix E: Complete Regression Analysis Results

1. Multiple Regressions for Domestic Participation Rates

	Multiple R	R-Square	Adjusted R-square	Std. Err. of Estimate	Rows Ignored	
Summary						
	0.75	0.57	0.46	0.07	0	
	Degrees of Freedom	**Sum of Squares**	**Mean of Squares**	**F**	**p-Value**	
ANOVA Table						
Explained	5	0.14	0.03	5.03	0.00	
Unexplained	19	0.10	0.01			
	Coefficient	**Standard Error**	**t-Value**	**p-Value**	**Confidence Interval 95%**	
Regression Table					Lower	Upper
Constant	-0.50	0.23	-2.15	0.04	-0.98	-0.01
Antidirector Rights	0.05	0.01	3.95	0.00	0.02	0.07
Gini Coefficient of Income	0.00	0.00	-1.29	0.21	-0.01	0.00
MC/GDP	-0.01	0.03	-0.32	0.75	-0.08	0.06
Log GDP per capital	0.14	0.04	3.08	0.01	0.04	0.23
Dummy-language	0.07	0.06	1.13	0.27	-0.06	0.20

2. Multiple Regressions for Foreign Equity Holding Rates

	Multiple R	R-Square	Adjusted R-square	Std. Err. of Estimate	Rows Ignored	
Summary						
	64.67%	41.83%	31.80%	19.14%	0	
	Degrees of Freedom	**Sum of Squares**	**Mean of Squares**	**F**	**p-Value**	
ANOVA Table						
Explained	5	0.76	0.15	4.17	0.01	
Unexplained	29	1.06	0.04			
	Coefficient	**Standard Error**	**t-Value**	**p-Value**	**Confidence Interval 95%**	
Regression Table					Lower	Upper
Constant	-0.58	0.51	-1.15	0.26	-1.62	0.45
Antidirector Rights	0.00	0.03	-0.14	0.89	-0.06	0.06
Gini Coefficient of Income	-0.01	0.01	-0.96	0.34	-0.02	0.01
MC/GDP	-0.05	0.08	-0.57	0.57	-0.21	0.12
Log GDP per capital	0.26	0.09	2.75	0.01	0.07	0.45
Dummy-Language	0.05	0.12	0.41	0.69	-0.20	0.30

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